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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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BAYER CORPORATION
PATENT DEPARTMENT
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PITTSBURGH, PA 15205

EXAMINER

WONG, EDNA

ART UNIT	PAPER NUMBER
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1741

DATE MAILED: 02/14/2002

3

Please find below and/or attached an Office communication concerning this application or proceeding.

A 9-3

Office Action Summary

Application No.

09/887,617

Applicant(s)

BULAN ET AL.

Examiner

Edna Wong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-10 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

Claim Rejections - 35 USC § 112

Claims **6-7 and 9** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6

line 3, it appears that the "hydrogen fluoride" is the same as that recited in claim 1, line 4. However, it is unclear if it is. If it is, then it suggested that the word -- the -- be inserted after the word "of" (first occurrence).

lines 3-4, it appears that the "non-fluorinated or partially fluorinated organic compound" (singular) is the same as the non-fluorinated or partially fluorinated organic compounds (plural) recited in claim 1, lines 2-3. However, it is unclear if it is.

Claim 7

lines 1-2, "the addition of non-fluorinated or partially fluorinated compound" lack antecedent basis.

Claim 9

line 1, "the reaction" lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

I. Claims **1 and 7-10** are rejected under 35 U.S.C. 102(e) as being anticipated by **Heider et al.** (US Patent No. 6,264,818).

Heider teaches a process for the continuous preparation of perfluorinated organic compounds comprising the step of:

electrochemically fluorinating a non-fluorinated or partially fluorinated organic compound with an electrolyte comprising hydrogen fluoride (col. 2, lines 3-26; and col. 8, claim 1) that has a quantity of charge that ranges from about 5 Ah per kg of electrolyte to about 600 Ah per kg of electrolyte (col. 4, lines 10-18; col. 5, lines 9-18 and 57-65; col. 6, lines 32-40; and col. 7, lines 45-53).

The addition of non-fluorinated or partially fluorinated compounds is carried out continuously (col. 3, lines 42-44).

The current density at which the electrolysis is carried out is from about 5 to

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about 40 mA/cm² (= 0.1 to 3.5 A/dm²) and the voltage is from about 5 to about 10 volts (= 4.0 to 6.5 V) [col. 3, lines 31-36; and col. 8, claim 1].

The reaction is carried out at a temperature of from 0 to about 20°C (col. 4, line 2, col. 5, line 1; col. 6, line 24; col. 7, lines 16-17; and col. 8, claim 1) and a pressure of from about 0.8 to about 2 bar (= 1 to 3 bar) [col. 3, lines 25-30; and col. 8, claim 1].

The hydrogen fluoride used has an arsenic content of less than about 10 ppm (= 0 ppm).

II. Claims 1, 7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by **DE 2,725,211**.

The DE reference teaches a process for the continuous preparation of perfluorinated organic compounds comprising the step of:

electrochemically fluorinating a non-fluorinated or partially fluorinated organic compound with an electrolyte comprising hydrogen fluoride that has a quantity of charge that ranges from about 5 Ah per kg of electrolyte to about 600 Ah per kg of electrolyte (= a quantity of electricity of ≥ 1 Ah/cm³ of electrolyte) [Derwent abstract].

The addition of non-fluorinated or partially fluorinated organic compounds is carried out continuously or discontinuously (abstract).

The voltage is from about 5 to about 10 volts (= 5-7 V) [abstract].

The reaction is carried out at a temperature of from 0 to about 20°C (8-10 degrees) [abstract].

The hydrogen fluoride used has an arsenic content of less than about 10 ppm (= 0 ppm).

III. Claims 1, 4, 6-8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by **Bulan et al.** (US Patent No. 5,366,597).

Bulan teaches a process for the continuous preparation of perfluorinated organic compounds comprising the step of:

electrochemically fluorinating a non-fluorinated or partially fluorinated organic compound with an electrolyte comprising hydrogen fluoride that has a quantity of charge that ranges from about 5 Ah per kg of electrolyte to about 600 Ah per kg of electrolyte (col. 2, lines 18-41).

The electrolyte at the commencement of the fluorination comprises from about 98% by weight of hydrogen fluoride and 2% by weight of non-fluorinated or partially fluorinated organic compound (col. 2, lines 6-10).

The addition of non-fluorinated or partially fluorinated organic compounds is carried out continuously or discontinuously (= continuously metered) [col. 3, lines 9-10 and 26-28; and col. 4, lines 14-16].

The non-fluorinated or partially fluorinated organic compounds are sulfolane, sulfolene, butylsulfonyl fluoride or mixtures thereof (col. 2, lines 18-47).

The current density at which the electrolysis is carried out is from about 5 to about 40 mA/cm² (col. 3, lines 13-14 and 51-52; and col. 4, lines 20-21) and the voltage

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is from about 5 to about 10 volts (= 4.0 to 6.5 V) [col. 2, lines 14-17].

The reaction is carried out at a temperature of from 0 to about 20°C (col. 1, line 67 to col. 2, line 2).

The hydrogen fluoride used has an arsenic content of less than about 10 ppm (= 0 ppm).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims 2, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heider et al. (US Patent No. 6,264,818) as applied to claims 1 and 7-10 above.

Heider is as applied above and incorporated herein.

Heider does not teach wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte; wherein electrolyte salts are added to the hydrogen fluoride; and wherein the electrolyte at the commencement of the fluorination comprises from about 98% by weight of hydrogen fluoride and 2% by weight of non-fluorinated or partially fluorinated organic compound.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of Heider with wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte because the quantity of charge is a result-effective variable and one skilled in the art has the skill to calculate the quantity of charge that would determine the success of the desired reaction to occur, i.e., perfluorination, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

As to wherein electrolyte salts are added to the hydrogen fluoride, this is well within the skill of the artisan because this would have increased the conductivity of the cell contents. Conventional conductivity additives includes dimethyldisulfide (DMDS), lithium fluoride, methyl acetate, sodium fluoride and acetic anhydride.

As to wherein the electrolyte at the commencement of the fluorination comprises from about 98% by weight of hydrogen fluoride and 2% by weight of non-fluorinated or partially fluorinated organic compound, Heider teaches 310 g of liquid hydrogen fluoride and 158.2 g of a 36% triethylphosphane solution in hydrogen fluoride (cols. 3-4, Example 1). The amounts of hydrogen fluoride and non-fluorinated or partially fluorinated compounds are all varied in the Examples 1-5 (cols. 3-8). It has been held that changes in concentration is not a patentable modification; however, such changes

may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Boesch*. 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and MPEP § 2144.05(b).

About 98% by weight of hydrogen fluoride and 2% by weight of non-fluorinated or partially fluorinated organic compound appear to be mere optimizations which solves no stated problems and produces no unexpected results, unless proven otherwise.

II. Claims **2, 5-6 and 8-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over **DE 2,725,211** as applied to claims 1, 7 and 10 above.

The DE reference is as applied above and incorporated herein.

The DE reference does not teach wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte; wherein electrolyte salts are added to the hydrogen fluoride; wherein the electrolyte at the commencement of the fluorination comprises from about 98% by weight of hydrogen fluoride and 2% by weight

of non-fluorinated or partially fluorinated organic compound; wherein the current density at which the electrolysis is carried out is from about 5 to about 40 mA/cm²; and a pressure of from about 0.8 to about 2 bar.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of the DE reference with wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte because the quantity of charge is a result-effective variable and one skilled in the art has the skill to calculate the quantity of charge that would determine the success of the desired reaction to occur, i.e., perfluorination, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

As to wherein electrolyte salts are added to the hydrogen fluoride, this is well within the skill of the artisan because this would have increased the conductivity of the cell contents. Conventional conductivity additives includes dimethyldisulfide (DMDS), lithium fluoride, methyl acetate, sodium fluoride and acetic anhydride.

As to wherein the electrolyte at the commencement of the fluorination comprises from about 98% by weight of hydrogen fluoride and 2% by weight of non-fluorinated or partially fluorinated organic compound, this would have been well within the skill of the

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artisan dependent upon how much perfluorinated organic compounds one wants to produce.

As to wherein the current density at which the electrolysis is carried out is from about 5 to about 40 mA/cm², the DE reference appears to disclose a process at least in a similar manner as instantly claimed. Therefore, it would have been within the skill of the art to expect that the current density in the electrolysis of the DE reference would have been from about 5 to about 40 mA/cm², absent evidence to the contrary.

Furthermore, the current density is a result-effective variable and one skilled in the art has the skill to calculate the current density range that would determine the success of the desired reaction to occur, i.e., perfluorination, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Furthermore, a current density from about 5 to about 40 mA/cm² appears to be a mere optimization which solves no stated problems and produces no unexpected results, unless proven otherwise.

As to a pressure of from about 0.8 to about 2 bar, although the DE reference is silent as to the pressure of the reaction, the reaction inherently has a pressure. It would have been well within the skill of the artisan to have expected that the pressure of the reaction is at standard atmosphere (= 1 atmosphere or 1 bar), absent evidence to the contrary.

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III. Claims 2, 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Bulan et al.** (US Patent No. 5,366,597) as applied to claims 1, 4, 6-8 and 10 above.

Bulan is as applied above and incorporated herein.

Bulan does not teach wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte; wherein electrolyte salts are added to the hydrogen fluoride; and a pressure of from about 0.8 to about 2 bar.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would have been motivated to have modified the process of Bulan with wherein the quantity of charge is kept in the range from about 50 to about 200 Ah per kg of electrolyte because the quantity of charge is a result-effective variable and one skilled in the art has the skill to calculate the quantity of charge that would determine the success of the desired reaction to occur, i.e., perfluorination, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

As to wherein electrolyte salts are added to the hydrogen fluoride, this is well within the skill of the artisan because this would have increased the conductivity of the cell contents. Conventional conductivity additives includes dimethyldisulfide (DMDS),

lithium fluoride, methyl acetate, sodium fluoride and acetic anhydride.

As to a pressure of from about 0.8 to about 2 bar, although Bulan is silent as to the pressure of the reaction, the reaction inherently has a pressure. It would have been well within the skill of the artisan to have expected that the pressure of the reaction is at standard atmosphere (= 1 atmosphere or 1 bar), absent evidence to the contrary.

Allowable Subject Matter

The following is a statement of reasons for the indication of allowable subject matter:

Claim 3 defines over the prior art of record because the prior art does not teach or suggest a process according to Claim 1, wherein the hydrogen fluoride has a water content of less than about 300 ppm, a sulfuric acid content of less than about 300 ppm, a sulfur dioxide content of less than about 30 ppm and an arsenic content of less than about 30 ppm.

The prior art does not contain any language that teaches or suggests the above. Therefore, a person skilled in the art would not have been motivated to adopt the above conditions, and a prima facie case of obviousness cannot be established.

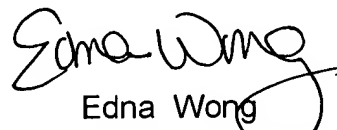
Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (703) 308-3818. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703) 308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 873-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Edna Wong
Primary Examiner
Art Unit 1741

EW
February 13, 2002